

CECW-ET

**DEPARTMENT OF THE ARMY
U.S. Army Corps of Engineers
Washington, DC 20314-1000**

EM 1110-2-2610

Manual
No. 1110-2-2610

12 December 2003

**Engineering and Design
LOCK AND DAM GATE OPERATING AND CONTROL SYSTEMS**

Table of Contents

Subject	Paragraph	Page
Chapter 1 Introduction		
Purpose.....	1-1	1-2
Applicability	1-2	1-2
References.....	1-3	1-2
Distribution	1-4	1-2
Plates	1-5	1-2
General.....	1-6	1-2
Mandatory Requirements.....	1-7	1-3
Chapter 2 Lock Operating Equipment		
Miter Gate	2-1	2-2
Sector Gate.....	2-2	2-24
Vertical Lift Gate (Locks).....	2-3	2-28
Culvert Tainter Valve	2-4	2-36
Chapter 3 Spillway Operating Equipment		
Tainter Gate	3-1	3-2
Vertical Lift Gate (Spillways).....	3-2	3-16
Wicket Gate	3-3	3-19
Hinged Crest Gate.....	3-4	3-23
Submergible Tainter Gate.....	3-5	3-27

EM 1110-2-2610
12 Dec 03

Chapter 4 Control

Introduction .....	.4-1	4-2
Design Considerations .....	.4-2	4-2
Main Control Equip & Instrumentation.....	.4-3	4-16
Safety & Security.....	.4-4	4-59
Procurement Considerations .....	.4-5	4-60
Power Supply .....	.4-6	4-68

Chapter 5 System and Component

General Design Criteria .....	.5-1	5-3
Hydraulic Fluid Power.....	.5-2	5-9
Lubrication.....	.5-3	5-25
Fire Protection.....	.5-4	5-25
Ice and Debris Control .....	.5-5	5-25
Safety .....	.5-6	5-28
Corrosion Protection .....	.5-7	5-29

Chapter 6 Installation, O&M and Inspection

Installation .....	.6-1	6-2
Operation and Maintenance .....	.6-2	6-4
Inspection and Testing .....	.6-3	6-5
Access for Inspection and Maintenance Activities.....	.6-4	6-8

Appendix A References

Appendix B Illustrative Plates

Appendix C Sample Computations

Glossary